

Advances of pCEC and qCE and their applications in pharmaceutical and biochemical analyses

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Abstract

Recent advances in two capillary electrokinetic separation technologies, namely pressurized capillary electrochromatography (pCEC) and quantitative capillary electrophoresis (qCE), will be reported.

A binary solvent delivery system consisting of two pumps is used to provide a pressurized flow that is complementary to the electroosmosis in order to overcome the problems and difficulties associated with try-out and bubbles formation in the column in capillary electrochromatography (CEC). In such a pCEC system, a binary solvent gradient separation that is similar to that in HPLC, by programming the composition of mobile phase can be performed. Quantitative sample injection can be realized through a rotary-type of nano-injector with a 10 nL sample loop.

Another innovative qCE technique equipped with 10 nL sample injector was also developed which can perform quantitative analysis like in HPLC. Several type of detectors that are suitable for capillary-based pCEC and qCE techniques were developed, such as UV/Vis, LIF, ELSD detectors and MS interface. These analytical technologies were successfully used in many investigations including applications on pharmaceutical, biological, environmental analyses, as well as metabolomics.